

good faith of Dr. Gray's observations, I am irresistibly led to the conclusion that the opercula assigned by him to *Diplommatina* were adventitious, and that if not assignable to the young of *Alycæus strangulatus* which is found abundantly in company with *Diplommatina*, they must belong to some other shell, and have become accidentally mixed with specimens to which they did not originally belong.

Since the publication of the observations contained in p. 286 of the 'Annals' for April, I have inspected specimens of *Diplommatina minor*, Gr., and am fully satisfied that it has no real connexion with *Diplommatina*. The aspect of the aperture is quite Cyclostomatous; that of *Diplommatina* is far from being so. Pfeiffer calls it a dubious species; I have no hesitation in rejecting it from the genus, and consider that if it should be, as is most probable, provided with an operculum, that circumstance will in nowise affect the question as regards the true species. I add a note on the characters. The aperture is circular, and at once indicates a *Cyclostoma*; the peristome is interrupted above and is double; the inner lamina, which is subporrect and expanded, being divided from the outer reflected lip by a sulcus. The two upper whorls alone are closely and obtusely costulate, the rest are smooth; there is no trace of an internal plica. The doubling of the peristome is effected in a different manner from that of the *Diplommatinae*, in which the retro-relict second lip is only visible laterally, and not in front as in *Cyclostoma minus*.

In Mr. Gaskoin's two specimens of the Australian *Diplommatina*, the internal columellar plica is to be detected.

London, May 1853.

XLI.—On the Genera of the Tribe Duboisieæ.

By JOHN MIERS, Esq., F.R.S., F.L.S.

[Continued from p. 381.]

ANTHOTROCHE.

THIS genus was first made known by Endlicher in his 'Genera Plantarum,' p. 1404, his short description of the only species being published in his 'Nov. Stirp. Mus. Vindob.' p. 7. It was placed by him among the *Salpiglossideæ*, but referred by Mr. Bentham to *Solanaceæ*, no doubt because of the more isomeric structure of its flowers. I first called attention in 1849 to the singular fact of the extrorse position of the stamens, and confirmed the general analogy of its characters to *Anthocercis*. Lately it has been noticed by M. A. DeCandolle, 'Prodr.' xiii. 676,

as a genus to be excluded from *Solanaceæ*, and referred to *Scrophulariaceæ*, because of its unilocular reniform anthers; its generic character there given is literally copied from the original diagnosis of Endlicher, entirely omitting the remarkable features indicated by me (*huj. op.* iii. 171). The unilocular anther, as in *Verbascum*, is however not peculiar to the *Scrophulariaceæ*, for though occurring in several cases, it is there more an exception than a general rule, being at the same time common in other families, for instance in the *Myoporaceæ*: indeed, abundant evidence has been given to prove, as I have remarked in regard to *Anthocercis*, that neither the structure of the anther, nor even the didynamous character of the stamens, are by themselves sufficient to retain a doubtful genus within the limits of the *Scrophulariaceæ*. The fact, in combination with other circumstances, that manifestly determines the position of *Anthotroche* among the *Atropaceæ*, rather than in *Scrophulariaceæ*, is the structure of the seed; this resembles that of *Anthocercis*, *Cyphanthera* and *Duboisia*; it is cylindrical, slightly curved, containing, enveloped in albumen, a nearly straight cylindrical embryo, with minute cotyledons, and a terete radicle pointing to the base of the seed, the hilum being on the lateral ventral sinus. Whatever may be its true position, one conclusion is certain, that where *Anthocercis* is placed, *Anthotroche* must accompany it. This agreement is evident, not only in their similarly extrorse stamens, but in the æstivation of the corolla; this last feature is not so easily distinguished in the last-mentioned genus, on account of the shortness of the lobes of its border, and their being densely covered on both sides with long branching hairs, which, being closely interlaced, conceal the margins. It differs however from *Anthocercis* and *Cyphanthera* in the more expanded and almost rotate form of its corolla, its shorter and more obtuse lobes, and in its stamens being all perfect and equal in number to the segments of the border, although one of them is somewhat shorter. The peculiarity in the form of its anther consists in its being, like that of *Cyphanthera* and *Duboisia*, roundly discoid and deeply reniform; its attachment to the filament is in the deep sinus upon the side looking toward the style, while the external face is marked by a nearly annular groove that runs concentrically near the margin: along this line it bursts widely open, in an almost peltate form, by its two nearly equal gaping valves, showing a globular prominence in the middle, which is the receptacle of the pollen. This structure is the result, as I have already shown (p. 370), of the total abortion of one of the lobes that ordinarily constitute an anther, and not, as generally supposed, of the confluence of the two lobes. *Anthotroche* offers another distinguishing feature, in its perfectly free cup-shaped disk, that

invests the base of the ovary: this must not be confounded with a somewhat similar appearance in *Anthocercis* and *Duboisia*, where the corolla breaks away by a circumscissile line, leaving a membranaceous cup surrounding the base of the ovary, as in *Lycium*, *Fabiana*, *Nierembergia*, *Sessea*, *Vestia*, *Cestrum* and some others: the disk, although also existing in *Anthocercis* and *Duboisia*, is not free to the base, as in *Anthotroche*, but is wholly adnate, and often inconspicuous, its obsolete lobes being sometimes almost free. The segments of the calyx and corolla are frequently six, when the stamens correspond in number: under the usual pentamerous development, one or two of the lobes of the border and one of the stamens are sometimes smaller and defective, but this appears always caused by the injuries produced by insects, to which the flowers are subject, rather than the consequence of any real irregularity.

The following is an amended description of its generic character:—

ANTHOTROCHE, Endl. Gen. Pl. p. 1404; Nov. Stirp. Mus. Vindob. 7; A. DC. Prodr. xiii. 674.—Char. emend.—*Calyx* campanulatus, ultra medium 5–6-fidus, laciniis subacutis, extus lanato-tomentosus, intus glanduloso-pubescens, persistens. *Corolla* extus lanato-tomentosa, tubo basi breviter cylindrico, dein late campanulato, limbo explanato-rotato, 5–6-partito, laciniis subæqualibus, utrinque tomentosus, æstivatione (ut in *Anthocercide*) applicativa. *Stamina* 5–6, inclusa, tubi coarctatione ex annulo dense tomentoso orta, *filamenta* hinc complanata, valde geniculata et barbata, superne glabra, et tenuiora, apice reflexa; *antheræ* rotundatæ, profunde cordatæ, versus sinum affixæ, extrorsæ, 1-loculares, 2-valves, rima hippocrepiformi extus dehiscentes, receptaculo pollinis in fundum globoso. *Pollen* globosum, reticulatum. *Ovarium* obovatum, dimidio basali disco libero cupulari carnosio margine crenato circumdatum, 2-loculare: *ovula* plurima, adscendentia, placentis utrinque dissepimento adnatis affixa. *Stylus* filiformis, apice incurvus. *Stigma* clavatum, sub-bilobum. *Capsula* ovata, calyce recondita, 2-locularis, septifrage 4-valvis, valvis coriaceis, dissepimento plano, lunato, coriaceo, soluto, imo seminifero, superne fisso. *Semina* tereti-oblonga, subincurva, hilo infra medium faciei ventralis affixa, *testa* favoso-scribiculata. *Embryo* (sec. Endl.) in axi *albuminis* carnosii, *cotyledonibus* brevissimis obtusis, *radicula* infera tereti, basi incurva, imo spectante.—Frutex *Australasiacus* ramosus, *pube* brachiato densissime lanato-tomentoso vestitus; *folia* alterna, ovata vel obovata, integra, crassiuscula, brevissime petiolata, juniores in ramulis novellis valde conferti, et hinc flores solitarii, subses-

siles, parvi, violacei, valde approximati, et subterminales: calyx et corolla dense tomentosi.

1. *Anthotroche pannosa*, Endl. *loc. cit.*; Walpers, Rep. iii. 236; DC. Prodr. xiii. 676;—fruticosa, tomento cinereo dense pannosa, ramis pedalibus, ramulis alternis, foliis obovatis vel ovatis, obtusissimis, basi nonnihil attenuatis, brevissime petiolatis, crassiusculis, adultis stellato-pubescentibus, junioribus densissime tomentosis, imbricatim aggregatis; floribus solitariis, subsessilibus, imo bracteatis, limbo violaceo, lineis purpureis picto, capsula calyce immutato obtecta.—Australasia, ora orientali ad Swan River.—*v. s. in herb. Hook. et Lindley.* (Drummond).

This plant has a very peculiar aspect, greatly resembling that of *Leucophyllum*, being densely covered with long grayish tomentum, the hairs of which are, in like manner, flexuously branched and matted together, and often stellated at some of the joints; this falls off in the older leaves, which are then marked by several distinct stellated points. The leaves are 10 to 12 lines long (including the very short petiole of half a line) and 5 to 6 lines broad; they are entire, fleshy, without apparent nervures, somewhat rugose, and concolorous on both sides: the young leaves and flowers are crowded in the nascent branchlets, the corolla being small and of a violet hue: the tube of the calyx is 2 lines long, terminated by five equal teeth 3 lines in length, the obtuse bract being 3 lines long and 1 line broad; the basal contracted portion of the tube of the corolla is $1\frac{1}{2}$ line long, 1 line in diameter, hence it is suddenly campanular, another line longer, and 3 lines in diameter across the mouth, where it is terminated by five subequal expanded segments, each $1\frac{1}{2}$ line long and 1 line broad, expanded to a diameter of 6 lines. The capsule is $2\frac{1}{2}$ lines long and broad; the seeds are $\frac{1}{2}$ line in length and barely $\frac{1}{8}$ line in diameter: in the structure of the capsule and seed there is much analogy with that of *Leucophyllum**.

DUBOISIA.

This genus, first established by Mr. Robert Brown in his 'Prodrômus,' is very closely allied to *Anthocercis*, *Cyphanthera* and *Anthotroche*, scarcely differing from the former except in its baccate fruit. It was subsequently well figured by Endlicher in his 'Iconographia,' from drawings of the celebrated artist Ferd. Bauer, who accompanied Mr. Brown in his Australasian travels. It was placed by Mr. Bentham in his tribe *Salpiglossideæ*, but

* A figure of this plant, with ample details of its structure, will be given in a supplementary plate in the 'Illustrations of South Amer. Plants.'

subsequently I pointed out the features that separate it from the *Scrophulariaceæ*, and suggested its true position in the system among the *Atropaceæ*, in the tribe *Duboisieæ* (*huj. op. iii. 165*). Since the description of the typical plant, now forty-three years ago, no other species has been known, and that was called *D. myoporoides* by Mr. Brown, on account of the similarity of its habit to *Myoporum*. This genus, indeed, serves to connect the *Atropaceæ* with the *Myoporaceæ*, as at present limited, through *Disoon*, which has a monopetalous corolla with five equal segments, having an imbricated æstivation, with the same peculiar involution of the margins, as in the *Duboisieæ*. Like *Anthotroche* it has didynamous stamens, with similarly formed anthers, only that they are introrse: it has also a bilocular ovarium, but each cell has only a solitary suspended ovule; its fruit is also drupaceous and bilocular; of its embryo nothing is known: should it even have a superior radicle, as is most probable, its ordinal tendency would even then appear to lean more towards the *Scrophulariaceæ* than to the *Myoporaceæ*. The same may be said of *Nesogenes*, judging from the description given of its structure. The chief distinction between the *Scrophulariaceæ* and the bilocular section of the *Myoporaceæ* consists in the different direction of the embryo, but this character is of little value, as it arises merely from the more pendent or ascending position of the ovules, and in both cases the radicle points alike to the hilum. We must remember that exceptional cases of this kind occur in *Scrophulariaceæ*, for instance in *Leptorhabdos*, *Melampyrum* and *Tozzia*, which also have only two suspended ovules, where sometimes only a single seed becomes perfected, and where from its pendulous position the radicle is superior, contrary to the usual character of the family. Under such views, the ordinal tendencies of *Leptorhabdos* and *Disoon* appear to point in the same direction, from which the baccate fruit of the latter would not exclude it, because, although a rare occurrence in *Scrophulariaceæ*, this does sometimes occur, as in *Halleria*, &c.: in *Atropaceæ* it is more frequent. Consequently it would be more consistent to refer to *Scrophulariaceæ* all the genera of the *Myoporaceæ* possessing a bilocular ovarium, where the ovules are attached to a simple dissepiment, and to confine the limits of the *Myoporaceæ* to those genera where the dissepiment is so greatly produced and introflexed as to produce four distinct cells, and often other pseudo-cells. The latter, according to the views of most botanists, offer a structure closely approaching that of the *Verbenaceæ* and *Borraginaceæ* (the *Echial* alliance of Prof. Lindley): the former clearly belong to one of the orders of the great *Solanal* alliance as above suggested: the distinction in point of structure is considerable and manifest. In habit,

Disoon and *Nesogenes* are said scarcely to resemble Myoporaceous plants. Many points of analogy between these genera and *Sclerophylax* are deserving of attention. The genus last mentioned has a tubular corolla, the segments of which have an involuted æstivation, as in *Disoon*; five stamens, one of which is smaller; a superior bilocular ovary, with a single suspended ovule in each cell; the fruit is an indehiscent 2-celled carcerule, enclosed in the augmented calyx, with a single suspended seed in each cell, the somewhat terete embryo being enclosed in albumen with a small superior radicle. It differs, however, in the form of the anthers and the peculiar growth of the calyx in fruit. We must not forget, too, the analogy existing between *Disoon* and the *Selaginaceæ*, in their hippocrepiform 1-locular anthers, their didynamous stamens, and the structure of the ovary, fruit and seed. These genera, for the reasons above given, are probably more allied to the *Scrophulariaceæ* than to the *Verbenaceæ*. Mr. Bentham's view is probably well founded, that the true *Myoporaceæ* do not differ ordinally from the *Verbenaceæ*, which is confirmed by the occasional presence of albumen, as I have observed, in the seeds of the latter family.

Another novel point of structure in the *Duboisieæ* is worthy of our consideration. The placentæ are adnate to the base of the simple dissepiment, the upper portion of which is membranaceous and marked by a thickened nervure, where, as the ovary enlarges, this part becomes split and separated into two lateral portions, attached respectively to the opposite walls of the pericarp: consequently both the berry of *Duboisia* and the capsules of *Anthocercis*, *Cyphanthera* and *Anthotroche* are incompletely bilocular in the summit, and the dissepiment becomes more or less lunulate, as occurs in several genera of the *Goodeniaceæ*. Another fact, at the same time, should be remembered, the great approach in the character of the æstivation of the corolla among the *Duboisieæ*, to that existing in the *Goodeniaceæ*.

There is little to add to the observations already made upon the structure of this genus, except to indicate an error in its generic character, as given in the 'Prodromus' (DC. x. 191), where the radicle is said to point to the basilar hilum: this is an oversight; the radicle certainly points to the base of the seed; but the hilum, as in *Anthocercis* and its congeners, is seen upon the ventral face, a little below the middle, in the sinus of its slight curvature. Mr. Bentham there points to an error in Endlicher's interpretation of Bauer's analysis above referred to, wherein the seed is mistaken for the placenta, and a tubercle of the seed for the seed itself: whatever may have been Bauer's intention, I can confirm the truth of the above remarks from my own observation, with this difference, that the areolæ represented in the plate,

and said to be tubercular rugosities, are in fact deep hollows. The mode of its inflorescence is very peculiar, and similar to that of *Cyphanthera*.

The following designation of its generic features will be found to be more in accordance with the facts just enumerated:—

DUBOISIA, R. Br. Prodr. 448; Endl. Gen. n. 3906; DC. Prodr. x. 191.—Char. emendat.—*Calyx* parvus, campanulatus, æqualiter et breviter 5-dentatus, mox corollæ incremento sæpe fissus, et tunc sub-bilabiatus, persistens. *Corolla* late tubulosa, tubo superne vix ampliore, imo supra basin demum circumscisso, limbi laciniis 5, oblongis, obtusiusculis, tubo 4to brevioribus, patentibus, nervosis. *Stamina* 4, inclusa, didymana, cum rudimento quinti inter 2 longiora; *filamenta* paullo supra basin tubi inserta, hinc geniculata et dilatata, superne linearia, 2 majora tubo dimidio, 2 minora tubo 4to breviora, apice recurva; *antheræ* extrorsæ (iis *Anthotrochidis* similes). *Ovarium* ovatum, corollæ tubi reliquo imo indutum, 2-loculare; *ovula* pauca, dissepimento utrinque placentifero adnata, adscendentia. *Stylus* filiformis, brevis, apice declinatus. *Stigma* clavatum, 2-lobum. *Bacca* parva, globosa, vel ovata, calyce immutato fisso suffulta, 2-locularis. *Semina* pauca perfecta (6–8), adscendentia, oblongo-cylindrica, incurva, ad dissepimentum subtenue superne incompletum utrinque adnata; *testa* crustacea, foveis magnis scrobiculata, *hilo* paullo infra medium in sinu ventrali; *embryo* in *albumine* teres, subincurvus, *cotyledonibus* brevissimis, *radicula* infera basi spectante et ut in *Anthocercide* hilo evitante.—Arbuscula *Novæ Hollandiæ*; folia *alterna*, lanceolato-oblonga, glaberrima, integra; paniculæ *ex axillis ramulorum novorum iterumque conjugatim brachiata*, brachiis (uno sæpe abortivo) utrinque e nodis geminatis cupularibus bracteatis ortis, bracteis cito caducis, pedicello terminali semper inter cupulas ultimas surrecto; flores parvi, pedicellati, cærulescentes; baccæ parvæ, nigræ.

1. *Duboisia myoporoides*, R. Br. loc. cit.; Endl. Iconogr. tab. 77; DC. Prodr. loc. cit.—*Notelæa* ligustrina, Sieb. Fl. Nov. Holl. Exs. 259. non Vent.;—omnino glabra, foliis lanceolato-oblongis, obtusiusculis, e medio in petiolum elongatum gracilem sulcatum gradatim angustatis, utrinque concoloribus, crassiusculis, nervis plurimis parallelo-divergentibus intra marginem cæsim arcuatis immersis; ramulis floriferis, brevibus, erectiusculis; fructiferis demum valde elongatis, et tunc quam folio magis deflexis, horizontaliter patentibus: pedicellis solitariis, in dichotomiis paniculæ terminalibus, brevibus: baccis piso minoribus, nigris, calyce fisso suffultis.—*Novæ Hollandiæ* ora
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orientali.—v. s. in herb. Hook., Nov. Holl. (Sieber), *River Hastings* (Fraser), *Port Macquarie* (Backhouse), *Sydney* (hort. bot. cult.).—In herb. Heward, *Illawarra* (A. Cunningham).

Bauer's figure, above referred to, gives an excellent representation of this plant when in fruit: at first, however, the younger flowering shoots assume the appearance of very branching panicles, the lower ramifications being alternate, the upper ones opposite and dichotomously branching, with a single flower in the intervals; they are about 3 inches long, but when the fruit becomes ripened, they attain a length of 6 or 10 inches, and are much more deflexed than the axillary leaf from which they spring: most of the bracts fall away, but others, especially the lower ones, grow ultimately into leaves: the pedicels are 2 lines long in flower, and 3 lines in fruit; the calyx is $\frac{3}{4}$ line long; the corolla 2 lines in length, and is said to be of a bluish lilac colour: it flowers in October: the berry is $1\frac{1}{2}$ line in diameter*.

XIII.—*Notes on some British Zoophytes.* By WYVILLE THOMSON, F.R.P.S. &c., Lecturer on Botany, Univ. and Marischal College, Aberdeen.

[With a Plate.]

BEFORE describing what I consider as an addition to an obscure group of zoophytes allied to the *Sertulariadae*, I shall premise a few remarks on the peculiarities of one of its immediate neighbours—*Coppinia arcta*. I shall do this in order to illustrate more fully the relations of the new genus.

Coppinia differs from all other known full-grown *Sertulariadae* in having no common axis to its polypidom. Each polyp seems to be possessed of a separate curved tube, one extremity free and of a stout horny consistence, the other somewhat flask-shaped, much thinner, and imbedded in a coherent mass of horny granules. This spongy matrix is hollowed out into a layer of minute areolar chambers.

Additions to the colony appear to take place by the budding of the hydræ at the base of the tube-like cell, by which process a new hydra is formed, which is separated from its parent, secretes a tube-cell of its own, and ultimately excretes a quantity of granular matter which pushes it back still further from the rest of the community.

This interstitial propagation goes on only to a certain extent,

* Analytical details of this species will be given in a supplementary plate, in the *Illust. of South Amer. Plants.*